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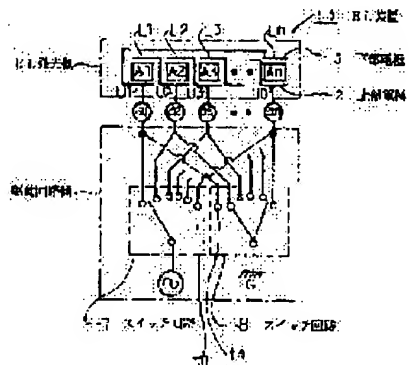
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(54) ELECTRO-LUMINESCENCE DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an electro-luminescence(EL) device in which the number of connecting lines is reduced as much as possible, the wiring is made free, and the cost is reduced.

SOLUTION: Independent light emitting sections A1, A2...An of an EL device and the inverters, which are the driving sections for the emitting sections, are linked by connecting lines and the EL device emits light by applying AC voltages thereto from the inverters. Upper section electrodes U1, U2...Un and lower section electrodes L1, L2...Ln are independently provided for the sections A1, A2...An of the EL. Then, electrical connections are respectively made for the electrode U1 of the section A1 and the electrode Ln of the section An, the electrode U2 of the section A2 and the electrode L1 of the section A1 and finally the electrode Un of the section An and a lower section electrode Ln-1 of a light emitting section An-1. Then, power supply input sections a1, a2...'an' are respectively provided for the connected electrodes. Thus, one connecting line is eliminated and the wiring of the bundled up connecting lines is made free. Moreover, the cost is reduced by the reduction in the number of connecting lines.



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CLAIMS

[Claim(s)]

[Claim 1] Independent light-emitting parts A1, A2, and A3 ... In the electroluminescence equipment with which the aforementioned light-emitting part emits light by having An, pinching each light-emitting part by the up electrode and the lower electrode, and impressing the voltage from a drive circuit Each light-emitting parts A1, A2, and A3 of the aforementioned electroluminescence ... for every An Up electrodes U1, U2, and U3 ... Un and lower electrodes L1, L2, and L3 ... Ln is prepared independently. The up electrode U1 of a light-emitting part A1, and the lower electrode Ln of a light-emitting part An the up electrode U2 of a light-emitting part A2, and the lower electrode L1 of a light-emitting part A1 The up electrode Un of a light-emitting part An and lower electrode Ln-1 of light-emitting part An-1 are connected electrically, respectively. the up electrode U3 of a light-emitting part A3, and the lower electrode L2 of a light-emitting part A2 ... They are the power supply input sections a1, a2, and a3 to each connected electrode... Electroluminescence equipment characterized by preparing an, respectively.

[Claim 2] Electroluminescence equipment according to claim 1 characterized by preparing the switching circuit which connects a power supply or a ground to the power supply input section a1, a2, a3, ..., or an, and the switching circuit which connects a ground or a power supply to the aforementioned power supply input sections a1 and a2, a3, ..., or an in the drive circuit side of the aforementioned electroluminescence.

[Claim 3] To the drive circuit side of the aforementioned electroluminescence, they are each power supply input sections a1, a2, and a3... Electroluminescence equipment according to claim 1 characterized by preparing the switching circuit which connects an to a power supply, a ground, or a free-lancer (it does not flow anywhere).

[Claim 4] Light-emitting parts A1, A2, and A3 which achieved [aforementioned] independence ... An is electroluminescence equipment the claim 1 characterized by luminescence changing one by one in order of a request, 2, or given in three.

[Claim 5] Light-emitting parts A1, A2, and A3 which achieved [aforementioned] independence ... An is electroluminescence equipment according to claim 1 or 3 characterized by making one desired piece or desired plurality emit light simultaneously.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to EL equipment which makes the light-emitting part with which the electroluminescence (it is hereafter written as EL) which is a light-emitting part, and the inverter which is the mechanical component were connected by path cords, such as lead wire, and plurality became independent emit light.

[0002]

[Description of the Prior Art] It is used for the equipment which used EL of recent years many, arranging EL which is a light-emitting part, and the inverter which is the mechanical component in a separate place, and making an inverter connect with EL by path cords, such as lead wire. And if this path cord responds to a use, that into which leading about of a path cord is freely changed by elasticity is called for. For example, EL is attached in a Christmas tree, theatrical costumes, etc., when movement is expressed, or the luminescent color is changed and it expresses a certain display by changing the light-emitting part grade of EL one by one, an inverter is arranged in somewhere else [****] and a path cord which can do leading about freely is desired. If there are two or more light-emitting part grades, along with it, many path cords are also needed. Although these path cords are bundled and it connects with an inverter, if the tied number of a path cord increases, stiffness will appear and a limit will come out to the free nature of leading about.

[0003] In the conventional EL, it has three or more light-emitting parts, and the structure of common EL equipment where this light-emitting part changes luminescence one by one is shown in drawing 6.

Drawing 6 is explanatory drawing of EL equipment which has three light-emitting parts.

[0004] In drawing 6, EL equipment 10 has three light-emitting parts A1, A2, and A3, and has the up electrode 2 (a part for a drawing solid line part) in each of these light-emitting parts A1, A2, and A3, and forms the input terminals a1, a2, and a3 of each power input from the up electrode 2.

[0005] it has the lower electrode 5 (a part for a drawing middle point line part) in the undersurface side of the aforementioned light-emitting parts A1, A2, and A3, and this lower electrode 5 is gone across and formed in the whole surface ranging over each light-emitting part A1, A2, and A3 -- having -- the -- the input terminal a4 is formed from the edge in part

[0006] Drawing 7 is the cross section of each light-emitting part. In drawing 7, a light-emitting part A1 (A2, A3) is the structure which laminating formation of the up electrode 2, an emitter 3, a dielectric 4, and the lower electrode 5 was carried out at the undersurface side of a bright film 1, and was covered with the insulating moisture-proof film 6. And the up electrode 2 is the structure where the end is pulled out by the method of outside and forms input terminals a1, a2, and a3. here -- the up electrode 2 -- light-emitting parts A1, A2, and A -- although prepared independently for every three, respectively, a bright film 1, the emitter 3, the dielectric 4, the lower electrode 5, and the insulating moisture-proof film 6 are formed in the whole surface ranging over light-emitting parts A1, A2, and A3

[0007] Drawing 8 is the circuit diagram showing the connection circuit by the side of EL light-emitting

part and a drive circuit. in drawing 8 , the input terminal a4 of the lower electrode 5 connects with AC power supply -- having -- **** -- light-emitting parts A1, A2, and A3 -- the switching circuit (S1, S2, S3) with a ground is prepared in the input terminals a1, a2, and a3 of each up electrode 2 (U1, U2, U3) at 3 drive circuit side

[0008] With the above-mentioned EL equipment, ON-OFF of three switching circuits S1, S2, and S3 winds, is returned, and structure where light-emitting parts A1, A2, and A3 change luminescence one by one is performed.

[0009] If a ground is now connected to the power supply input section a1 by the switching circuit S1 of a light-emitting part A1, since current will flow to the up electrode 2 (U1) and the lower electrode 5 (L) of a light-emitting part A1, a light-emitting part A1 emits light very brightly. On the other hand, the switching circuits S2 and S3 of light-emitting parts A2 and A3 are in an OFF state, and the ground is not connected to the power supply input sections a2 and a3. Dielectricity of the current to which the up electrode 2 (U2, U3) of light-emitting parts A2 and A3 is flowing to the lower electrode 5 (L) although the current from a ground does not flow is carried out, and minute current flows. For this reason, light-emitting parts A2 and A3 start slight luminescence with very low luminescence brightness. However, since a light-emitting part A1 emits light very brightly, light-emitting parts A2 and A3 seem not to be conspicuous. When similarly a ground is connected to the power supply input section a2 by the switching circuit S2 of a light-emitting part A2 and the switching circuits S1 and S3 of light-emitting parts A1 and A3 are changed into an OFF state, it seems that only the light-emitting part A2 is emitting light. Thus, it has structure which changes a light-emitting part one by one, and emits light by changing the switch of a switching circuit one by one.

[0010] In the conventional structure where it explained above, in order that four input terminals may prepare, a path cord with an inverter needs four. It is carried out, if the movement which has changed light-emitting part grades, such as night, one by one using EL in a Christmas tree, theatrical costumes, etc. is displayed, or the luminescent color is changed one by one and it shows with a rich ornament recently. In such a case, the inverter of a drive is set to the place which is not visible by forming EL in the necessary place which is visible from a front face, and it is use ****. And EL and an inverter are connected with a path cord and a path cord is arranged through the place which does not look external as much as possible. At this time, a path cord is soft, and since leading about can do a narrow thing as much as possible, it is desirable.

[0011]

[Problem(s) to be Solved by the Invention] However, in the conventional technology mentioned above, it has the following troubles. That is, the structure where that in which four path cords are needed and some which have three light-emitting parts with conventional EL equipment have six light-emitting parts is completely the same is taken, and seven path cords are needed. That is, with a path cord, the number added one more is needed for the number of light-emitting parts. Thus, if a path cord increases and it will be bundled, taken about and carried out, on the whole, it will become thick, and the problem that it gives restrictions to free leading about by the basis appears. Moreover, since the number of a path cord increases, it becomes a cost rise. In the above-mentioned Prior art, the path cord of four core wires will be used, while the line became thick, hardness also came out and there were problems, like restrictions appear in free leading about.

[0012] this invention is made in view of the above-mentioned technical problem, and the purpose lessens the number of a path cord as much as possible, makes free leading about possible, and offers EL equipment which reduces cost.

[0013]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the electroluminescence equipment in this invention Independent light-emitting parts A1, A2, and A3 ... In the electroluminescence equipment with which the aforementioned light-emitting part emits light by having An, pinching each light-emitting part by the up electrode and the lower electrode, and impressing the voltage from a drive circuit Each light-emitting parts A1, A2, and A3 of the aforementioned

electroluminescence ... for every An Up electrodes U1, U2, and U3 ... Un and lower electrodes L1, L2, and L3 ... Ln is prepared independently. The up electrode U1 of a light-emitting part A1, and the lower electrode Ln of a light-emitting part An the up electrode U2 of a light-emitting part A2, and the lower electrode L1 of a light-emitting part A1 The up electrode Un of a light-emitting part An and lower electrode Ln-1 of light-emitting part An-1 are connected electrically, respectively. the up electrode U3 of a light-emitting part A3, and the lower electrode L2 of a light-emitting part A2 ... They are the power supply input sections a1, a2, and a3 to each connected electrode... It is characterized by preparing an, respectively.

[0014] Moreover, it is characterized by preparing the switching circuit which connects a power supply or a ground to the power supply input section a1, a2, a3, ..., or an, and the switching circuit which connects a ground or a power supply to the aforementioned power supply input sections a1 and a2, a3, ..., or an in the drive circuit side of the aforementioned electroluminescence.

[0015] Moreover, they are each power supply input sections a1, a2, and a3 to the drive circuit side of the aforementioned electroluminescence... It is characterized by preparing the switching circuit which connects an to a power supply, a ground, or a free-lancer (it does not flow anywhere).

[0016] Moreover, light-emitting parts A1, A2, and A3 which achieved [aforementioned] independence ... An is characterized by luminescence changing one by one in order of a request.

[0017] Moreover, light-emitting parts A1, A2, and A3 which achieved [aforementioned] independence ... An is characterized by making one desired piece or desired plurality emit light simultaneously.

[0018]

[Embodiments of the Invention] Based on a drawing, EL equipment in this invention is explained below. Drawing 1 , drawing 2 , and drawing 3 are explanatory drawings of EL equipment with which drawing 1 has three or more light-emitting parts with respect to the form of operation of the 1st of this invention. Drawing 2 is the circuit diagram showing the connection circuit by the side of EL light-emitting part and a drive circuit. Drawing 3 is a circuit diagram which explains the ON-OFF state of the lighting power supply of EL based on the signal from a counter circuit.

[0019] In drawing 1 , the pattern formation state of the up electrode 2 (transparent electrode) of EL and the lower electrode 5 (back plate) is shown. Light-emitting parts A1, A2, and A3 which became independent, respectively ... It is prepared independently, respectively and the up electrode 2 of An is U1, U2, and U3... Un is formed. Each of this up electrode U1, U2, and U3 ... Un is the power supply input sections a1, a2, and a3 projected at the edge part... an is formed. Moreover, light-emitting parts [... Ln is formed.] A1, A2, and A3 ... The lower electrodes 5 of An are the above-mentioned up electrodes U1, U2, and U3... It is L1, L2, and L3 which were prepared independently in Un and the position which countered with each. And each lower electrode L1, L2, and L3 ... A flow pattern is taken about from the edge of Ln part, respectively, and they are the power supply input sections a1, a2, and a3... In the place of an It connects as electrically [the up electrode U2 and the lower electrode L2] as the up electrode L4, the lower electrode L1 allots the up electrode U3 and the lower electrode L3, and it has structure which connected the last lower electrode Ln with the up electrode U1, and was connected electrically. An emitter and a dielectric are light-emitting parts A1, A2, and A3 like the conventional example, although omitted among drawing... Ranging over An, it is prepared in the whole surface.

[0020] next, drawing 2 -- setting -- here -- AC power supply -- the power supply input section a1, a2, or a3 -- the switching circuit 7 linked to ... or an, and a ground -- the power supply input section a1, a2, or a3 -- the switching circuit 8 linked to ... or an is formed Furthermore, they are the power supply input sections a1 and a2 so that drawing 3 may explain... It is constituted so that AC power supply and a ground may not connect with an simultaneously.

[0021] Drawing 3 is drawing having shown the concrete composition of drawing 2 . In drawing 3 , if the square wave signal of constant frequency is taken out by the dispatch circuit 9, EL flashing caution signal will be taken out for every constant twice which has a dispatch signal by the counter circuit 10. Each EL1, EL2, EL3 ... Based on the signal from the counter circuit 10 which outputs the constant twice signal defined for every ELn, two transistor (Ta1, Tb1, Ta2 and Tb2, or Ta3, Tb3 ... Tan, Tbn) circuits

will turn on, current will flow, and the EL will light up. Therefore, while a desired light-emitting part can change one by one and being able to make light emit, they are the power supply input sections a1 and a2... AC power supply and a ground are not simultaneously connected to an.

[0022] If it is in the above-mentioned structure, AC power supply is now connected to the power supply input section a1 prepared in the light-emitting part A1 and a ground is connected to the power supply input section a2 prepared in the light-emitting part A2, AC power supply will be connected to the up electrode U1 of a light-emitting part A1, and the lower electrode Ln of a light-emitting part An. On the other hand, a ground is connected to the up electrode U2 of a light-emitting part A2, and the lower electrode L1 of a light-emitting part A1. And the light-emitting part A1 with which current flowed to both the up electrode U1 and the lower electrode L1 emits light by high brightness. Up electrode U1 Light-emitting parts A2 and A3 with which current is flowing they to be [any of the up electrode U2 connected to the lower electrode Ln or the lower electrode L1 connected] only ... Although An starts luminescence by very low brightness Since the difference of brightness is remarkable, it seems that only the light-emitting part A1 is emitting light.

[0023] When similarly AC power supply is connected to the power supply input section a2 prepared in the light-emitting part A2 and a ground is connected to the power supply input section a3 prepared in the light-emitting part A3, it seems that only the light-emitting part A2 is emitting light.

[0024] Moreover, when AC power supply is connected to the power supply input section an similarly prepared in the light-emitting part A1 and a ground is connected to the power supply input section a1 prepared in the light-emitting part An, it seems that only the light-emitting part An is emitting light.

[0025] Thus, by switching a ground to a switching circuit 7 and a switching circuit 8 one by one, a light-emitting part changes one by one, and emits light. Although the form of this operation showed what supplied AC power supply to the switching circuit 7, and supplied the ground to the switching circuit 8, even if it is the structure which supplied the ground to the switching circuit 7 and supplied AC power supply to the switching circuit 8, the same result is obtained conversely. In addition, the luminescence turn of a light-emitting part can be freely set up by the design of a switching circuit.

[0026] By making it the above structure, the path cord by the side of EL luminescence and a drive circuit requires only the part of the number of the power supply input sections, and can be managed with the form of this operation by the part of a-n, i.e., n path cords. In a Prior art, n+1 is needed and an effect reducible one is done so.

[0027] For this reason, if it is arranged in the position distant the EL luminescence and drive circuit side, a path cord is bundled and drawn and it is in a ***** state, since there are few path cords one than a Prior art, the free nature of the increase of softness and leading about appears from the thing of the conventional technology. Moreover, though natural, since there are few path cords one, it is that the cost is cut down.

[0028] Moreover, even if it does not prepare a terminal for connecting to a ground tn terminal and the power supply input section a1 for connecting the power supply input section an to AC power supply with the form of the 1st operation which were shown in drawing 2 , it is possible to make all light-emitting parts emit light. In this case, when making An-1 emit light from a light-emitting part A1, make the light switch on with the connection method mentioned above, and a light-emitting part An is made to emit light, and a ** case connects AC power supply to the power supply input section a1, and should just connect a ground to the power supply input section an. Moreover, they are the power supply input sections a2, a3, and a4 in this case... Short-circuit of AC power supply and a ground can be prevented by making it the circuitry which AC power supply and a ground do not connect to an-1 simultaneously.

[0029] Drawing 4 and drawing 5 are circuit diagrams in which drawing 4 shows the connection circuit by the side of EL light-emitting part and a drive circuit with respect to the gestalt of operation of the 2nd of this invention. Drawing 5 is explanatory drawing showing the connection situation of each switching circuit in case each light-emitting part emits light.

[0030] In drawing 4 , since the structure by the side of EL luminescence is completely the same as the gestalt of the 1st operation of the above-mentioned, explanation is omitted. As the structure of the

switching circuit by the side of a drive circuit is shown in drawing 3 , they are each power supply input sections a1, a2, and a3... Switching circuits S1, S2, and S3 connected to AC power supply, a ground, or a free-lancer (it does not flow anywhere) at an ... It has Sn. And each switching circuit is designed in the circuit which a ground does not connect with AC power supply simultaneously.

[0031] Drawing 5 is each light-emitting parts A1, A2, and A3... The connection situation of each switching circuit in case An emits light is shown. It is now here, and the power supply input section a1 is connected to AC power supply (+), the power supply input section a2 is connected to a ground (-), and luminescence of a light-emitting part A1 is other power supply input sections a3... When an is free, light is emitted by high brightness. Since the lower electrode Ln of a light-emitting part An is united with the up electrode U1 of a light-emitting part A1, it is connected to AC power supply. Moreover, since the up electrode U2 of a light-emitting part A2 is united with the lower electrode L1 of a light-emitting part A1, it is connected with a ground.

[0032] Since voltage is impressed to the up-and-down electrode, high luminescence of brightness is performed, and on the other hand, as for a light-emitting part An and a light-emitting part A2, although the luminescence of the low fine smallness of brightness occurs in response to the influence of current which flowed to one of the two's electrode, since the difference of brightness is remarkable, a light-emitting part A1 seems to accept it light-emitting part A1 and to emit light.

[0033] In addition, even when a ground connects with the power supply input section a1 and AC power supply connects with the power supply input section a2, a light-emitting part A1 emits light by high brightness. Moreover, the power supply input section a2 connects with AC power supply (or ground), the power supply input section a3 connects with a ground (or AC power supply), and luminescence of a light-emitting part A2 is other power supply input sections a1 and a4... When an is free, light is emitted by high brightness. The following, light-emitting parts A3 and A4 ... The same is said of An. Therefore, a setup of the luminescence turn of a light-emitting part and the number of light-emitting parts can make one desired piece or two or more desired light-emitting parts emit light simultaneously by connection of a switching circuit.

[0034] For example, what is necessary is to connect the power supply input sections a1 and a3 to AC power supply, to connect the power supply input section a2 to a ground, and just to connect other power supply input sections free, when making a light-emitting part A1 and a light-emitting part A2 turn on simultaneously. Moreover, what is necessary is to connect the power supply input sections a1 and a4 to AC power supply, to connect the power supply input sections a2 and a3 to a ground, and just to connect other power supply input sections free, when making a light-emitting part A1 and a light-emitting part A3 turn on simultaneously. Furthermore, what is necessary is to connect the power supply input sections a1 and a3 to AC power supply, to connect the power supply input sections a2 and a4 to a ground, and just to connect other power supply input sections free, in making light-emitting parts A1-A3 turn on simultaneously.

[0035] If the path cord with an inverter is seen from a Prior art also with the gestalt of operation of **** 2, it will be [one] few, and will end and the same effect as the gestalt of the 1st operation will be acquired.

[0036]

[Effect of the Invention] As mentioned above, hardness is eased and, as for the path cord which there were few path cords one than the thing of a Prior art, and they ended, and the path cord decreased, and was made into the bunch, the flexibility comes out to leading about of a path cord. Moreover, only in the part to which the path cord decreased, cost becomes cheap.

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TECHNICAL FIELD

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PRIOR ART

[Description of the Prior Art] It is used for the equipment which used EL of recent years many, arranging EL which is a light-emitting part, and the inverter which is the mechanical component in a separate place, and making an inverter connect with EL by path cords, such as lead wire. And if this path cord responds to a use, that into which leading about of a path cord is freely changed by elasticity is called for. For example, EL is attached in a Christmas tree, theatrical costumes, etc., when movement is expressed, or the luminescent color is changed and it expresses a certain display by changing the light-emitting part grade of EL one by one, an inverter is arranged in somewhere else [****] and a path cord which can do leading about freely is desired. If there are two or more light-emitting part grades, along with it, many path cords are also needed. Although these path cords are bundled and it connects with an inverter, if the tied number of a path cord increases, stiffness will appear and a limit will come out to the free nature of leading about.

[0003] In the conventional EL, it has three or more light-emitting parts, and the structure of common EL equipment where this light-emitting part changes luminescence one by one is shown in drawing 6.

Drawing 6 is explanatory drawing of EL equipment which has three light-emitting parts.

[0004] In drawing 6, EL equipment 10 has three light-emitting parts A1, A2, and A3, and has the up electrode 2 (a part for a drawing solid line part) in each of these light-emitting parts A1, A2, and A3, and forms the input terminals a1, a2, and a3 of each power input from the up electrode 2.

[0005] it has the lower electrode 5 (a part for a drawing middle point line part) in the undersurface side of the aforementioned light-emitting parts A1, A2, and A3, and this lower electrode 5 is gone across and formed in the whole surface ranging over each light-emitting part A1, A2, and A3 -- having -- the -- the input terminal a4 is formed from the edge in part

[0006] Drawing 7 is the cross section of each light-emitting part. In drawing 7, a light-emitting part A1 (A2, A3) is the structure which laminating formation of the up electrode 2, an emitter 3, a dielectric 4, and the lower electrode 5 was carried out at the undersurface side of a bright film 1, and was covered with the insulating moisture-proof film 6. And the up electrode 2 is the structure where the end is pulled out by the method of outside and forms input terminals a1, a2, and a3. here -- the up electrode 2 -- light-emitting parts A1, A2, and A -- although prepared independently for every three, respectively, a bright film 1, the emitter 3, the dielectric 4, the lower electrode 5, and the insulating moisture-proof film 6 are formed in the whole surface ranging over light-emitting parts A1, A2, and A3

[0007] Drawing 8 is the circuit diagram showing the connection circuit by the side of EL light-emitting part and a drive circuit. in drawing 8, the input terminal a4 of the lower electrode 5 connects with AC power supply -- having -- **** -- light-emitting parts A1, A2, and A3 -- the switching circuit (S1, S2, S3) with a ground is prepared in the input terminals a1, a2, and a3 of each up electrode 2 (U1, U2, U3) at 3 drive circuit side

[0008] With the above-mentioned EL equipment, ON-OFF of three switching circuits S1, S2, and S3 winds, is returned, and structure where light-emitting parts A1, A2, and A3 change luminescence one by one is performed.

[0009] If a ground is now connected to the power supply input section a1 by the switching circuit S1 of a light-emitting part A1, since current will flow to the up electrode 2 (U1) and the lower electrode 5 (L) of a light-emitting part A1, a light-emitting part A1 emits light very brightly. On the other hand, the switching circuits S2 and S3 of light-emitting parts A2 and A3 are in an OFF state, and the ground is not connected to the power supply input sections a2 and a3. Dielectricity of the current to which the up electrode 2 (U2, U3) of light-emitting parts A2 and A3 is flowing to the lower electrode 5 (L) although the current from a ground does not flow is carried out, and minute current flows. For this reason, light-emitting parts A2 and A3 start slight luminescence with very low luminescence brightness. However, since a light-emitting part A1 emits light very brightly, light-emitting parts A2 and A3 seem not to be conspicuous. When similarly a ground is connected to the power supply input section a2 by the switching circuit S2 of a light-emitting part A2 and the switching circuits S1 and S3 of light-emitting parts A1 and A3 are changed into an OFF state, it seems that only the light-emitting part A2 is emitting light. Thus, it has structure which changes a light-emitting part one by one, and emits light by changing the switch of a switching circuit one by one.

[0010] In the conventional structure where it explained above, in order that four input terminals may prepare, a path cord with an inverter needs four. It is carried out, if the movement which has changed light-emitting part grades, such as night, one by one using EL in a Christmas tree, theatrical costumes, etc. is displayed, or the luminescent color is changed one by one and it shows with a rich ornament recently. In such a case, the inverter of a drive is set to the place which is not visible by forming EL in the necessary place which is visible from a front face, and it is use ****. And EL and an inverter are connected with a path cord and a path cord is arranged through the place which does not look external as much as possible. At this time, a path cord is soft, and since leading about can do a narrow thing as much as possible, it is desirable.

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EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, hardness is eased and, as for the path cord which there were few path cords one than the thing of a Prior art, and they ended, and the path cord decreased, and was made into the bunch, the flexibility comes out to leading about of a path cord. Moreover, only in the part to which the path cord decreased, cost becomes cheap.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the conventional technology mentioned above, it has the following troubles. That is, the structure where that in which four path cords are needed and some which have three light-emitting parts with conventional EL equipment have six light-emitting parts is completely the same is taken, and seven path cords are needed. That is, with a path cord, the number added one more is needed for the number of light-emitting parts. Thus, if a path cord increases and it will be bundled, taken about and carried out, on the whole, it will become thick, and the problem that it gives restrictions to free leading about by the basis appears. Moreover, since the number of a path cord increases, it becomes a cost rise. In the above-mentioned Prior art, the path cord of four core wires will be used, while the line became thick, hardness also came out and there were problems, like restrictions appear in free leading about.

[0012] this invention is made in view of the above-mentioned technical problem, and the purpose lessens the number of a path cord as much as possible, makes free leading about possible, and offers EL equipment which reduces cost.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the electroluminescence equipment in this invention Independent light-emitting parts A1, A2, and A3 ... In the electroluminescence equipment with which the aforementioned light-emitting part emits light by having An, pinching each light-emitting part by the up electrode and the lower electrode, and impressing the voltage from a drive circuit Each light-emitting parts A1, A2, and A3 of the aforementioned electroluminescence ... for every An Up electrodes U1, U2, and U3 ... Un and lower electrodes L1, L2, and L3 ... Ln is prepared independently. The up electrode U1 of a light-emitting part A1, and the lower electrode Ln of a light-emitting part An the up electrode U2 of a light-emitting part A2, and the lower electrode L1 of a light-emitting part A1 The up electrode Un of a light-emitting part An and lower electrode Ln-1 of light-emitting part An-1 are connected electrically, respectively. the up electrode U3 of a light-emitting part A3, and the lower electrode L2 of a light-emitting part A2 ... They are the power supply input sections a1, a2, and a3 to each connected electrode... It is characterized by preparing an, respectively.

[0014] Moreover, it is characterized by preparing the switching circuit which connects a power supply or a ground to the power supply input section a1, a2, a3, ..., or an, and the switching circuit which connects a ground or a power supply to the aforementioned power supply input sections a1 and a2, a3, ..., or an in the drive circuit side of the aforementioned electroluminescence.

[0015] Moreover, they are each power supply input sections a1, a2, and a3 to the drive circuit side of the aforementioned electroluminescence... It is characterized by preparing the switching circuit which connects an to a power supply, a ground, or a free-lancer (it does not flow anywhere).

[0016] Moreover, light-emitting parts A1, A2, and A3 which achieved [aforementioned] independence ... An is characterized by luminescence changing one by one in order of a request.

[0017] Moreover, light-emitting parts A1, A2, and A3 which achieved [aforementioned] independence ... An is characterized by making one desired piece or desired plurality emit light simultaneously.

[0018]

[Embodiments of the Invention] Based on a drawing, EL equipment in this invention is explained below. Drawing 1 , drawing 2 , and drawing 3 are explanatory drawings of EL equipment with which drawing 1 has three or more light-emitting parts with respect to the gestalt of operation of the 1st of this invention. Drawing 2 is the circuit diagram showing the connection circuit by the side of EL light-emitting part and a drive circuit. Drawing 3 is a circuit diagram which explains the ON-OFF state of the lighting power supply of EL based on the signal from a counter circuit.

[0019] In drawing 1 , the pattern formation state of the up electrode 2 (transparent electrode) of EL and the lower electrode 5 (back plate) is shown. Light-emitting parts A1, A2, and A3 which became independent, respectively ... It is prepared independently, respectively and the up electrode 2 of An is U1, U2, and U3... Un is formed. Each of this up electrode U1, U2, and U3 ... Un is the power supply input sections a1, a2, and a3 projected at the edge part... an is formed. Moreover, light-emitting parts [... Ln is formed.] A1, A2, and A3 ... The lower electrodes 5 of An are the above-mentioned up electrodes U1,

U2, and U3... It is L1, L2, and L3 which were prepared independently in Un and the position which countered with each. And each lower electrode L1, L2, and L3 ... A flow pattern is taken about from the edge of Ln part, respectively, and they are the power supply input sections a1, a2, and a3... In the place of an It connects as electrically [the up electrode U2 and the lower electrode L2] as the up electrode L4, the lower electrode L1 allots the up electrode U3 and the lower electrode L3, and it has structure which connected the last lower electrode Ln with the up electrode U1, and was connected electrically. An emitter and a dielectric are light-emitting parts A1, A2, and A3 like the conventional example, although omitted among drawing... Ranging over An, it is prepared in the whole surface.

[0020] next, drawing 2 -- setting -- here -- AC power supply -- the power supply input section a1, a2, or a3 -- the switching circuit 7 linked to ... or an, and a ground -- the power supply input section a1, a2, or a3 -- the switching circuit 8 linked to ... or an is formed Furthermore, they are the power supply input sections a1 and a2 so that drawing 3 may explain... It is constituted so that AC power supply and a ground may not connect with an simultaneously.

[0021] Drawing 3 is drawing having shown the concrete composition of drawing 2 . In drawing 3 , if the square wave signal of constant frequency is taken out by the dispatch circuit 9, EL flashing caution signal will be taken out for every constant twice which has a dispatch signal by the counter circuit 10. Each EL1, EL2, EL3 ... Based on the signal from the counter circuit 10 which outputs the constant twice signal defined for every ELn, two transistor (Ta1, Tb1, Ta2 and Tb2, or Ta3, Tb3 ... Tan, Tbn) circuits will turn on, current will flow, and the EL will light up. Therefore, while a desired light-emitting part can change one by one and being able to make light emit, they are the power supply input sections a1 and a2... AC power supply and a ground are not simultaneously connected to an.

[0022] If it is in the above-mentioned structure, AC power supply is now connected to the power supply input section a1 prepared in the light-emitting part A1 and a ground is connected to the power supply input section a2 prepared in the light-emitting part A2, AC power supply will be connected to the up electrode U1 of a light-emitting part A1, and the lower electrode Ln of a light-emitting part An. On the other hand, a ground is connected to the up electrode U2 of a light-emitting part A2, and the lower electrode L1 of a light-emitting part A1. And the light-emitting part A1 with which current flowed to both the up electrode U1 and the lower electrode L1 emits light by high brightness. Up electrode U1 Light-emitting parts A2 and A3 with which current is flowing they to be [any of the up electrode U2 connected to the lower electrode Ln or the lower electrode L1 connected] only ... Although An starts luminescence by low brightness very much Since the difference of brightness is remarkable, it seems that only the light-emitting part A1 is emitting light.

[0023] When similarly AC power supply is connected to the power supply input section a2 prepared in the light-emitting part A2 and a ground is connected to the power supply input section a3 prepared in the light-emitting part A3, it seems that only the light-emitting part A2 is emitting light.

[0024] Moreover, when AC power supply is connected to the power supply input section an similarly prepared in the light-emitting part A1 and a ground is connected to the power supply input section a1 prepared in the light-emitting part An, it seems that only the light-emitting part An is emitting light.

[0025] Thus, by switching a ground to a switching circuit 7 and a switching circuit 8 one by one, a light-emitting part changes one by one, and emits light. Although the gestalt of this operation showed what supplied AC power supply to the switching circuit 7, and supplied the ground to the switching circuit 8, even if it is the structure which supplied the ground to the switching circuit 7 and supplied AC power supply to the switching circuit 8, the same result is obtained conversely. In addition, the luminescence turn of a light-emitting part can be freely set up by the design of a switching circuit.

[0026] By making it the above structure, the path cord by the side of EL luminescence and a drive circuit requires only the part of the number of the power supply input sections, and can be managed with the form of this operation by the part of a-n, i.e., n path cords. In a Prior art, n+1 is needed and an effect reducible one is done so.

[0027] For this reason, if it is arranged in the position distant the EL luminescence and drive circuit side, a path cord is bundled and drawn and it is in a ***** state, since there are few path cords one than a

Prior art, the free nature of the increase of softness and leading about appears from the thing of the conventional technology. Moreover, though natural, since there are few path cords one, it is that the cost is cut down.

[0028] Moreover, even if it does not prepare a terminal for connecting to a ground terminal and the power supply input section a1 for connecting the power supply input section an to AC power supply with the form of the 1st operation which were shown in drawing 2, it is possible to make all light-emitting parts emit light. In this case, when making An-1 emit light from a light-emitting part A1, make the light switch on with the connection method mentioned above, and a light-emitting part An is made to emit light, and a ** case connects AC power supply to the power supply input section a1, and should just connect a ground to the power supply input section an. Moreover, they are the power supply input sections a2, a3, and a4 in this case... Short-circuit of AC power supply and a ground can be prevented by making it the circuitry which AC power supply and a ground do not connect to an-1 simultaneously.

[0029] Drawing 4 and drawing 5 are circuit diagrams in which drawing 4 shows the connection circuit by the side of EL light-emitting part and a drive circuit with respect to the form of operation of the 2nd of this invention. Drawing 5 is explanatory drawing showing the connection situation of each switching circuit in case each light-emitting part emits light.

[0030] In drawing 4, since the structure by the side of EL luminescence is completely the same as the form of the 1st operation of the above-mentioned, explanation is omitted. As the structure of the switching circuit by the side of a drive circuit is shown in drawing 3, they are each power supply input sections a1, a2, and a3... Switching circuits S1, S2, and S3 connected to AC power supply, a ground, or a free-lancer (it does not flow anywhere) at an ... It has Sn. And each switching circuit is designed in the circuit which a ground does not connect with AC power supply simultaneously.

[0031] Drawing 5 is each light-emitting parts A1, A2, and A3... The connection situation of each switching circuit in case An emits light is shown. It is now here, and the power supply input section a1 is connected to AC power supply (+), the power supply input section a2 is connected to a ground (-), and luminescence of a light-emitting part A1 is other power supply input sections a3... When an is free, light is emitted by high brightness. Since the lower electrode Ln of a light-emitting part An is united with the up electrode U1 of a light-emitting part A1, it is connected to AC power supply. Moreover, since the up electrode U2 of a light-emitting part A2 is united with the lower electrode L1 of a light-emitting part A1, it is connected with a ground.

[0032] Since voltage is impressed to the up-and-down electrode, high luminescence of brightness is performed, and on the other hand, as for a light-emitting part An and a light-emitting part A2, although minute luminescence with low brightness occurs in response to the influence of current which flowed to one of the two's electrode, since the difference of brightness is remarkable, a light-emitting part A1 seems to accept it light-emitting part A1 and to emit light.

[0033] In addition, even when a ground connects with the power supply input section a1 and AC power supply connects with the power supply input section a2, a light-emitting part A1 emits light by high brightness. Moreover, the power supply input section a2 connects with AC power supply (or ground), the power supply input section a3 connects with a ground (or AC power supply), and luminescence of a light-emitting part A2 is other power supply input sections a1 and a4... When an is free, light is emitted by high brightness. The following, light-emitting parts A3 and A4 ... The same is said of An. Therefore, a setup of the luminescence turn of a light-emitting part and the number of light-emitting parts can make one desired piece or two or more desired light-emitting parts emit light simultaneously by connection of a switching circuit.

[0034] For example, what is necessary is to connect the power supply input sections a1 and a3 to AC power supply, to connect the power supply input section a2 to a ground, and just to connect other power supply input sections free, when making a light-emitting part A1 and a light-emitting part A2 turn on simultaneously. Moreover, what is necessary is to connect the power supply input sections a1 and a4 to AC power supply, to connect the power supply input sections a2 and a3 to a ground, and just to connect other power supply input sections free, when making a light-emitting part A1 and a light-emitting part A3

turn on simultaneously. Furthermore, what is necessary is to connect the power supply input sections a1 and a3 to AC power supply, to connect the power supply input sections a2 and a4 to a ground, and just to connect other power supply input sections free, in making light-emitting parts A1-A3 turn on simultaneously.

[0035] If the path cord with an inverter is seen from a Prior art also with the form of operation of **** 2, it will be [one] few, and will end and the same effect as the form of the 1st operation will be acquired.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is explanatory drawing of EL equipment which has three or more light-emitting parts concerning the gestalt of operation of the 1st of this invention.

[Drawing 2] It is the circuit diagram showing the connection circuit by the side of EL light-emitting part of drawing 1, and a drive circuit.

[Drawing 3] It is the circuit diagram which ON-OFF of the lighting power supply of EL explains based on the signal from a counter circuit with the transistor corresponding to each EL.

[Drawing 4] It is the circuit diagram showing the connection circuit by the side of EL light-emitting part concerning the gestalt of operation of the 2nd of this invention, and a drive circuit.

[Drawing 5] It is explanatory drawing showing the connection situation of each switching circuit in case each light-emitting part emits light.

[Drawing 6] It is explanatory drawing of EL equipment which has three conventional light-emitting parts.

[Drawing 7] It is the cross section of the conventional light-emitting part.

[Drawing 8] It is the circuit diagram showing the connection circuit by the side of the conventional EL light-emitting part and a drive circuit.

[Description of Notations]

2 U1, U2, U3 ... Un Up electrode

3 A1, A2, A3 ... An Light-emitting part

5 L1, L2, L3 ... Ln Lower electrode

7, 8, S1 S2 S3 ... Sn Switching circuit

a1, a2, a3 ... an Power supply input section

9 Dispatch Circuit

10 Counter Circuit

[Translation done.]

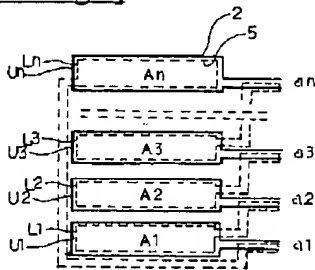
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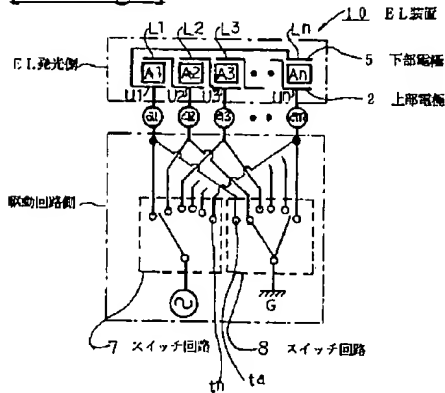
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DRAWINGS

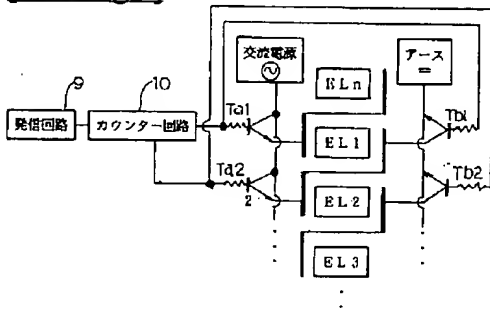
[Drawing 1]



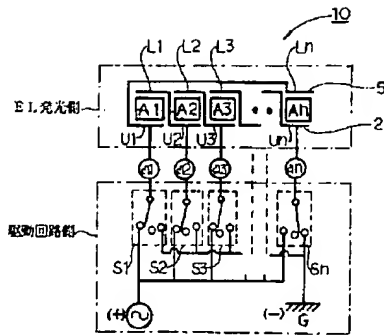
[Drawing 2]



[Drawing 3]



[Drawing 4]

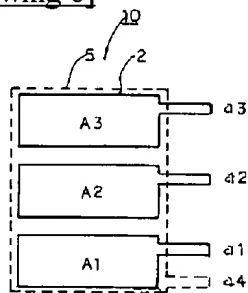


[Drawing 5]

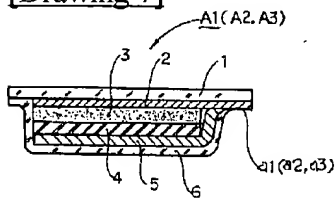
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	A2	F	+	-	F	F	F
部	A3	F	F	+	-	F	F
	A4	F	F	F	+	-	F
部	An	-	F	F	F	F	+
		+					-

(図中 フリーをF、⊕を+、⊖を-と表示する)

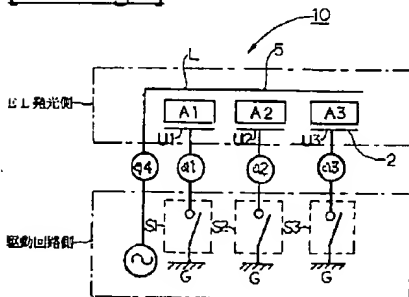
[Drawing 6]



[Drawing 7]



[Drawing 8]



[Translation done.]